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Vlerick Policy Paper Series

No. 11

From Bioethics to Biopolitics: A Game-Theoretic Institutional Life Sciences Perspective

September 2020

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Acknowledgements

Having been established in the field of financial services, this paper is the fifth issue of the **Vlerick Policy Paper Series** to appear in the domain of healthcare policy.

Chosen themes, scientific and technical data, expressed viewpoints and policy recommendations are under the full responsibility of the authors only. Only the authors are responsible for possible errors or omissions[1].

This paper is an essay on the highly-valued by society but felt-to-be excessively-priced nature of medicines.

The author wishes to express its gratitude to Lode Lauwaert, professor in the philosophy of technology at the KU Leuven Institute of Philosophy for providing the inspiration in his lectures at the Institute to write this essay.

Please cite as:

Van Dyck, W., 2020. From Bioethics to Biopolitics: A Game-Theoretic Institutional Life Sciences Perspective, Vlerick Policy Paper #11. Vlerick Healthcare Management Centre: Brussels.

[1] The author received no grants or payments related to this work.

Executive Summary

Technology, or better the socio-technical system should do good to society. But what is good? It depends on how people and their political ideologies see it. Which gives more credence to the conjecture that technology ethics should be studied at Science, Technology, and Society, STS level. So beyond the individual. This while it provides more wholistic insights, deeper understanding of potential ethical issues related to technology, which can lead to more robust solutions for what in essence are complex messy problems. In this essay I used a game-theoretic approach to confront the European welfare state- and the American individualistic free enterprise views to provide a synthetic picture on the role of technology to the good society. I felt it to provide me with an inspirational analytical philosophy perspective to further hypothesize change strategies on the political – business economic spectrum level. The latter having the force to transform firmly entrenched off-equilibrium or minimum performance equilibria into stag hunt positions. This in the context of technology governance and ethics.

1. Introduction

'Should ethics of technology target primarily the responsibility and ethics of individual humans or rather evaluate the entire socio-technical system?' This quote form Coeckelbergh's (2018) recent paper (cited further as CKB) inspired me for this essay. In his text, CKB claims that philosophers of technology should use more the resources and principles of political philosophy to study technology's contribution to the good life and the wider sociotechnical context, its culture and societal practice.

The access a "good society" wants to the most recent life-saving cell & gene therapies, disruptively innovative but felt to be unaffordable while excessively i.e. unfairly priced, will be used to test the CKB-conjectured need to go beyond the individual technical level into political philosophy when philosophizing about technology

The moral issue at stake here is the long-standing concern for the pharmaceutical industry to charge ever higher prices 'whatever the market will bear', which is perceived to be leading to unreasonable and unethical profits to the point that Rawls' distributive justice principle (1971) is at stake. Going back to Aristotle, Hume, and Mill this has to do with the fair distribution of society's burdens and benefits (Spinello, 1992). Charging premium prices for advanced medicinal therapies, considered by many to be a common good leads to an inequitable distribution pattern between the innovating company and society, the latter represented by the State executing a health economic policy as part of its welfare economics program.

Following, I intend to unpack the phenomenon of health technology ethics. This will be followed and concluded by a critical reflection of its impact on Western capitalist ideology-laden healthcare systems.

2. The need for a societal ethical view of health technology

To understand the social shaping of innovative life-saving pharmaceuticals there's a need for a societal ethical view of health technology as opposed to the patient-personal view of restoration of personal capabilities as expressed by Nussbaum's capabilities' list articulated in *Frontiers of Justice* evocating 'central requirements of a life with dignity', and for which an 'appropriate threshold level' needs to be reached (Nussbaum, 2006: 75). As an example, it is not the dilemma whether curing is enhancement or not that is at stake here.

Instead, taking a consequentialist society-level stance to life-saving but excessively priced medicinal technology is a necessity. This while saving life may be instrumentally good given both the intrinsic moral and extrinsic functional value created for now-cured patients. However, this does come at a cost society can afford lesser and lesser, bringing down part of its extrinsic value to our political ideology-laden health systems to the point of some of them feeling endangered in their existence.

Now, although 'technology has been a central theme in political thought for the past two hundred years' (Winner, 1977), its potentially disruptive impact on health systems has been up to now often neglected. However, with present-day breakthrough medicine prices up to 2 million $ per patient (Carr & Bradshaw, 2016; Dreitlein, Towse, Watkins, & Paramore, 2018) time is right now to move from bioethics to biopolitics (Obasogie & Darnovsky, 2018) when studying the impact this life sciences-based advanced technology (Stremersch & Van Dyck, 2009) has on the good society.

Taking this political philosophy stance, a socio-technical system perspective considers the good these life-saving therapies could bring in the global environment (Figert & Bell, 2014). However, I will emphasize the dominant markets of the West; the North-American and European institutional health systems. This while it is in these resource-rich societies that the epitome of global pharmaceuticalization [2] featuring disruptively innovative but societally unaffordable medicines comes most to the fore.

Theorizing on technology and the good society, then, I follow Brey (2018) that it is imperative to avoid a deterministic or technological neutrality worldview. It is in the societal technology access orchestration a specific institutional context provides for, that life-saving technology generates social impact.

Using Guala's (2016) game-theoretic institutional perspective I will analyze the moral issue at stake at a North American – European connected health system level and indicate some potential challenges and resolution avenues. This way, I will provide more evidence for the CKB-conjectured need to inform philosophy of technology with methods drawn from analytical political philosophy that epitomize the need to be sensitive to cultural differences when studying the relationship between technology and the good society.

[2] Figert and Bell (2014) define pharmaceuticalization as 'the process of understanding and/or treating social, behavioural, or bodily conditions with pharmaceuticals'. They further mention related to this phenomenon that 'the majority of sociological scholarship has investigated pharmaceuticalization as a primarily Western process and conceptualized it in modern terms'.

3. Looking through an institutional game-theoretic lens

High-priced medicines is an age-old ethical problem with no simple solutions. It is generally accepted in our Western economies that pharmaceutical companies, like all others, have the right to enjoy the fruits of capitalism and profit from their discoveries (Maitland, 2002). Early business ethicists argued that managers need to balance their legitimate drive for profit and return on investment 'with an equal consideration of the crucial importance of distributive justice[3]', aiming for 'a realistic and reasonable level of profitability' (Spinello, 1992).

However, others stress the need to recognize that the justified intellectual property rights leading to monopoly profits for innovative therapies is not an absolute right. Especially so knowing that the life-saving or curing nature of the latest most innovative therapies gives them excessive non-instrumental moral value. Hence, industry pundits note that this should be balanced with the right to life, the right to adequate health care, the right to essential life-saving drugs and the obligation to aid those in need' (De George, 2005). Furthermore, society's duty is to maximize population health gains whilst maximizing budget allocative efficiency (Luyten & Denier, 2019). Now, it is argued that excessively priced medicines will lead to societies not being able to buy anymore, which in turn would then lead to pharmaceutical companies not generating breakthroughs anymore in areas of high unmet medical need. Given the sustainable care duty of the State to its citizens the latter is then seen by some as the lesser of two evils (De George, 2005).

To resolve this dilemma of conflicting expectations, in recent years companies have responded with an exponentially increased interest in corporate social responsibility (CSR). CSR takes a morally-tainted stakeholder approach replacing the then prevalent legal-economic shareholder approach to conduct its business relationships (Haase & Raufflet, 2017). Now, some say CSR is not to be confused with morality (De George, 2005), expressing their fear that company assurance to serve resource-poor societies through non-market strategies (Bach & Allen, 2010; Henisz & Zelner, 2012) does not plead them free of recognizing their ethical responsibility exorbitantly pricing their medicines in the most affluent, typically Western side of their businesses.

Clearly, CSR should constitute responsible behavior of a company towards society. Only, this can be implemented following a variety of Western capitalist ideologies. Hence, in a neoliberal ideological frame, dominant in the US, it is referred to as *shareholder value maximization* (Djelic & Etchanchu, 2015). This stands in contrast to the EU-purported *'balance the interests of stakeholders'* felt-to-be morally superior sustainability view (Bowie, 2013: 91), which follows Freeman's instrumental stakeholder theory (1997,

[3] As specified in Rawl's (1971) *'A Theory of Justice'.*

2001) stating that to make profits firms should manage their stakeholder –not only shareholder– relations.

Both ideologies purposed to accomplish population health have been institutionalized on both sides of the Western world. Institutions are 'bundles of regulative rules that govern our interactions in sets of related games' (Hindriks & Guala, 2015). Regulative rules in a healthcare set following a socio-political ideology are considered to be fair by its constituents, thus exhibiting normative power. Thus, I propose to study the impact of technology on the good society through an institutional game-theoretic lens.

Using this normative language of rules-in-equilibrium theory (Guala, 2016: 70-85), they are bundled as conditional strategies of coordination games in which equilibrium profiles fulfil functions that make constituents feel better off –related to medical utility or fairness– as if they would pursue out-of-equilibrium outcomes.

Games' outcomes for innovative pharmaceutical industry (I) and public/private payers (P) can be verified on the matrix representations of Figure 1[4]. Institutional games can exhibit an 'orchestrator' (Guala, 2016; Hindriks & Guala, 2015) exhibiting a normative deontic power to have its constituents find an equilibrium in their transactions with each other.

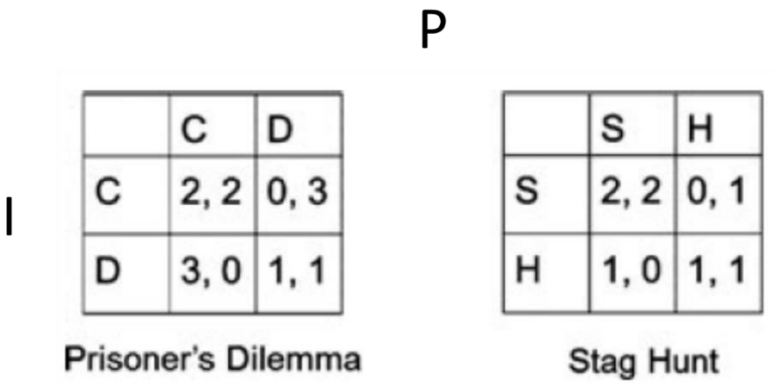

Figure 1: Institutional games compared

In the collectivist welfare state ideology-inspired EU the orchestrator role is most typically taken up by a State health policy. At present, being more and more confronted with an affordability challenge both innovative industry and public payer are seen to mutually defect; driven by medicine prices felt to be exorbitant, public payers respond more and more by defecting behaviour. Example strategies include compulsory licensing, and compounding or off-label use for economic reasons –as opposed to the mutually-accepted use for clinical reasons– of medicines in their legislations. This leads to

[4] Numbers in the game matrices should not be seen in absolute but conceptually in relation to each other. They represent respectively for Industry (I), a Business Return Index PI=PV/Co, which is present value of return (PV) divided by the investment cost (Co) needed. For the Payer side (P) it represents the Social Return on Investment (SRI) in the areas for R&D investment. Based on World Health Organization data this represents the total disease burden averted by an interventional effect. For more details, see Daems et al. (2014).

institutional games being trapped in a prisoner's dilemma or minimum payoff stag hunt equilibrium represented in Fig. 1 by respectively the (D,D) or (H,H) pairs of strategies. While minimum payoff (1,1) is guaranteed whatever the other does, both players implement these strategies independently from each other. This is the prototypical equilibrium where pharmaceutical technology's consumption in society is a failure. So how to make technology good to society?

Fortunately, next to providing predictability in situations of uncertainty as depicted above, norms can also create new behaviour. More specifically, it would be beneficial for both public payer and innovative industry to move into collaboration and thus reach a stag hunt maximum payoff equilibrium (S,S). This can be made possible when unilateral off-equilibrium behaviour[5] is discouraged and possibly collaborative behaviour is made more valuable for both parties[6]. However, collaborative strategy execution requires trust in each other. This means that collaboration will only be initiated and sustained in repetitive games given one of the parties consistently shows its willingness to collaborate. Answering this signal the other party will follow. Given the general present mistrust of public payers across the EU for the pharmaceutical industry, I feel the innovative industry has a duty to initiate this norm-setting. As an example, engaging with public policy makers in regulatory innovation emphasizing a 'conditional dialogue' among key healthcare system stakeholder has been successfully done in the field of cancer (Van Dyck, De Grève, Schots, Awada, & Geldof, 2016). This should be followed suit by other global pharmaceutical companies individually or collectively forming coalition strategies showing their institutional engagement (Doh, Lawton, & Rajwani, 2012; Dorobantu, Kaul, & Zelner, 2017).

In contrast, in the US private payer-dominated institutional health game the State level would be the most incentivized to move the pharmaceutical industry out of its defecting prisoners dilemma into a stag hunt equilibrium. This can be done by giving more power to the public payer side hence making the present industry staying in its off-equilibrium position less attractive. Doing so, Democrats politicians suggest here to 'create a Medicare for All, single payer, national health insurance program to provide everyone in the US with comprehensive health care coverage, free at the point of service[7]. It would allow Medicare (the largest US public payer) to negotiate with big pharmaceutical companies to lower prescription drug prices. At present, Medicare is by law not allowed to negotiate with industry.

But there's another more fundamental, cultural challenge to be resolved. Americans are technology optimists who don't want to wait long for the latest innovations, almost "whatever the price", the latter especially when dealing with life-

[5] Meaning discouraging (C,D), (D,C), (S,H), and (H,S) strategies
[6] Discouraging behaviour means moving from (C,D)=(0,3) to (S,H)=(0,1) ∧ (D,C)=(3,0) to (H,S)=(1,0). Making collaborative behaviour more beneficial for both can be expressed as (C,C)=(2,2) → (S,S)=(2+δ, 2+δ)
[7] https://berniesanders.com/en/issues/medicare-for-all/

saving medicines (Scannell, 2015). So, while collectivist-inspired European *public* payer systems would typically aim for equitable access to medical technology, individual rights-inspired US *private* health insurers want to provide their customers with wide access to medicines, even at a premium insurance price only the most affluent can afford. Too bad for the majority of the population. Therefore, a second move required to get the institutional system in stag hunt mode should necessarily convince the health insurers that they can significantly enhance their market by broadening the accessible patient pool from wealthy hypochondriacs towards the elderly and poor segments of society. This would raise the value of the stag hunt equilibrium to (S+δ, S+δ) and facilitate the departure from the present entrenched US health system prisoners dilemma equilibrium.

So, the institutional solution is to get the two dominant connected Western health games into stag hunt positions. As mentioned above, on the European side this implies *innovative industry-initiated* efforts enhancing trust between the innovative pharmaceutical industry and the State. On the US side, this would necessitate *State-initiated political change* now giving negotiating power to public payers and incentivizing private health insurers to change their business model. This will only happen if carried by the American people's cultural preferences related to health care. Hence, resolving the challenge of expensive medicines will be a hard sell in the hands of politicians in need of convincing spoiled over-paying US health customers to have less choice and wait longer for innovation. Not to speak of a majority feeling across all social classes that its individual freedom rights are infringed when having to sign up for a compulsory general health plan (Scannell, 2015).

It should be sufficiently clear by now that feelings of frustration and unfairness related to excessive pharmaceutical pricing is driven by a global business economic phenomenon, which in turn is driven by cultural differences hardwired in difficult-to-change capitalist ideology-laden health systems. The US pharmaceutical R&D and market is by far the largest in the world and global price-maker. The countries of Europe, fearing loss of sovereignty to the EU level, are free to negotiate only at individual State level, which makes them, at best, low-powered price-takers. Only capable of individually down-negotiating, within very strict limits, the prices set in the US.

Amplified by the growing anxiety that the latest advanced therapies coming at mind-blowing prices of 2 million per patient will endanger the continued existence of our European welfare state, it is safe to say that the extent to which health technology is seen to do good to society differs vastly across the two sides of the ocean.

4. Conclusion

Technology, or better the socio-technical system should do good to society. But what is good? As exposed above, it depends on how people and their political ideologies see it. Which gives more credence to the initial, also, CKB-carried conjecture that technology ethics should be studied at Science, Technology, and Society, STS level. So beyond the individual. This while it provides more wholistic insights, deeper understanding of potential ethical issues related to technology, which can lead to more robust solutions for what in essence are complex messy problems.

Applying an STS perspective to the advanced but excessively-priced medicines case allowed us to disentangle this messy complexity. This by making use of game-theoretic approaches applied at institutional level. For sure, this illustrative case warrants further study, probably in the field of cultural anthropology to better understand the culture variance driving people's views of the value and role of technology in a good society.

Finally, this essay used a game-theoretic approach to confront the European welfare state- and the American individualistic free enterprise views to provide a synthetic picture on the role of technology to the good society. I hope it has sufficiently shown to be a powerful method to further hypothesize change strategies on the political – business economic spectrum level having the force to transform firmly entrenched off-equilibrium or minimum performance equilibria into stag hunt positions. This in the context of technology governance and ethics.

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